ATGLANT ENGINEERING READINESS NEWSLETTER 1-00

CONTENTS

Director's Comments

Welcome to our spring edition of the ATGLANT N43 Bulletin. I hope you find it full of good technical information that you can use on your deckplates. We continue to focus on improving our end of the process, and this bulletin should play a role in presenting technical issues that support that goal. Some of the new things we are doing include Main Space Fire Assessments, increased time spent mentoring, pre-LOA visits and increased involvement in the schoolhouses.
I talk more about each of these in this edition.

R. P. Tjepkema

Published by the Afloat Training Group Atlantic, Engineering Readiness Directorate as a means to address changes, common problems, and often asked questions from staffs or ships concerning the engineering readiness and certification process. Points of contact for the submission of ideas or articles are: CAPT Doug MacCrea, Managing Editor, LCDR Rick Lawrence, Editor; and ENS Nora Herwick, Assistant Editor all at 757-445-4845.

Director's Comments

Main Space Firefighting qualification has always been a major part of the Engineering Process. Typically, we go aboard a ship during the final weeks of the maintenance availability and run a fire drill. We develop a list of discrepancies and leave them with the ship/ISIC. With the expertise we have at ATGLANT N43, I think we can do more. We now propose to conduct *MSF Assessments*. During these focused assessments, we observe your fire drill early in the yard period and develop Training Objectives. Early development of these Training Objectives will help you and the Regional ATGs concentrate your training efforts better. This serves not only to make your shipboard training better, but helps make your LTTs more productive. We can also review your Main Space Fire Doctrine as early in the process as you desire. Ships that have opted to take this route have developed better Firefighting Team proficiency than normally encountered at the end of availability. As an added benefit, these ships routinely qualify on their first run.

Time spent mentoring during maintenance availabilities has also increased. We have several officers who specialize in fundamental safety and management programs such as Tag Out, Electrical Safety, QA programs, and the like. We are sending, when requested, individual officers to brief wardrooms, chief messes, engineering departments, etc. in any of these areas. The Regional ATGs also have organic experts who can help the ship in updating these programs. Call your ship's mentor for further info.

We are now sending teams to SWOS where we host seminars with PCOs/PXOs/PCHENGs and, in the future, with DIVOs. These seminars have received good feedback. Hopefully your newly reporting officers will better understand the new process and, more importantly, have developed an effective approach to how they will tackle their engineering jobs. We are also sending a senior assessor to SEPEC, again, with the hope of reaching your key senior enlisted before they get to the ship.

Lastly, we are always looking for good space assessors to join our ranks. Our space assessors are involved in every facet of propulsion engineering and work with CHENGs on all platforms. They are involved in LPD 17, Smart Ship, NAVSEA design issues, and cutting edge DC ideas. They come to us after completing highly successful CHENG DH tours and, as such, enjoy a high overall rate of XO screening. Additionally, a large number of our billets are spot promote so you first tour Lieutenants who want to take the challenge can do so with an increase in pay! You'll find a tour at ATGLANT N43 challenging and career enhancing.

MANAGEMENT

ELECTRICAL SAFETY: DEAD FRONT FUSE TAGOUTS

By LCDR Rick Lawrence

Ref: (a) NSTM 300

Dead front fuse tag-outs continue to be a recurring problem. The requirements of reference (a) section 2.4.1 are fairly specific and written to reduce the risk of inadvertently energizing the tagged circuits.

Common deficiencies include:

- Tags not being taped over the fuse openings.
- Empty dead front fuse holders have been replaced.
- Dead front fuse holders have been tagged together and left adrift near the tagged openings.

The applicable section of reference (a) reads:

> "Dead front (plug type) fuse holders, such as those on FC and IC switchboards, should have the tag installed over the opening left by the removed fuse(s). Do not reinstall the empty fuse holder…"

The basis for this requirement is to ensure the circuit remains de-energized. By placing the danger tags over the dead front openings, it requires someone to deliberately move the danger tag to re-install the fuses and fuse holders. If the fuse holders are removed, there is no possibility that the circuit can be energized via the fuse openings. Lastly, if the dead front fuse holders are tagged, and no tag is placed on or near the dead front fuse openings, an ambitious operator is free to find untagged fuse holders, fuse them and insert them into the openings, subsequently energizing the circuit.

All electrical ratings and supervisors should be familiar with these requirements and the basis for them, for their safety and others. Tag out audits should be conducted with this level of detail and check for these discrepancies.

ELECTRICAL SAFETY PROGRAM

By LCDR Joe Bell

Ref: (a) NSTM 300
(b) OPNAVINST 5100.19C w/Ch 2

How safe is your electrical distribution system and how is your deck plate electrical safety program? Here is a list of things you ought to be looking for (this is by no means a comprehensive list and most are purely common sense).

Switchboards:

- Electrical Safety Matting:
  - Installed completely around the switchboards, load centers and consoles.
  - The deck under the matting stenciled "Electrical Matting Required."
  - The deck beneath the matting is dry.
  - The matting seams are sealed with either heat sealed seam material, electrical matting tape, or another strip of matting beneath the seam.
- Switchboard gages are in calibration and tamper seals (if required) in place.
- All fasteners for switchboard panels are installed.
- All indicator lights are functioning and covers are in place.
- EOP Diagram DLS is posted and there is a grease pencil available.
- Electrical grade rubber gloves, face shield and shorting probe are available for immediate use.
- All control fuses and covers are installed.

Fuse Boxes / Breaker Panels:

- Properly labeled for the specific circuit with fuse size/breaker to be installed.
- Correct size fuses/breakers installed.
- No dirt or debris in any electrical component (controller, fuse box, etc…)
- No extra fuses installed.
- Circuit breakers are the correct size and match the label.

General items throughout the ship:

- All lighting and electrical connections are held snugly by the stuffing nut.
- Lighting covers are in-place and not cracked.
- Grounding straps on motors and components are installed.
- Motor vent screens are clean and allow a proper flow of air.
- No exposed wires.
- Cable insulation appears intact, not charred or showing signs of chafing.

BOILER WATER CHEMISTRY

By LCDR Richard A. Radice

Ref: (a) NSTM 220

There is a misconception about the notes in reference (a) that discuss the criteria for serious contamination in after-on-line (AOL) boiler samples. These notes apply to main propulsion and waste heat boilers only. Sampling requirements for auxiliary boilers are covered in Section 220-29 of reference (a).

Paragraph 220-23.9 addresses serious contamination criteria for main propulsion boilers and contains the following note:

NOTE

"Alkalinity less than 0.05 epm or phosphate less than 5 ppm in the after on-the-line (AOL) sample is not moderate or serious contamination unless other criteria are met."

Paragraph 220-30.48 addresses waste heat boiler water contamination and contains the following note:

NOTE

"The above criteria do not apply to low alkalinity or phosphate in the after light-off sample or when hideout is occurring unless other symptoms of contamination are present."

Again, these notes apply to the criteria for Serious Contamination. They do not apply to the criteria for significant damage. Some ships have been using this note to justify a satisfactory after light off sample regardless of the test results.

These notes are included because the boiler may not have been operating long enough to thoroughly mix injected chemicals. The intention is to prevent adding more chemicals when they are not required.

If hideout has been determined to be occurring in accordance with reference (a), then actions must be taken in accordance with the following paragraphs:

- 220-23.46 (Main Propulsion Boilers)
- 220-30.67 (Waste Heat Boilers)

When the boiler must be operated under "serious", "significant damage" or "hideout conditions, then chemical addition is only required to keep alkalinity above 0.025 epm and phosphates above 5 ppm in waste heat boilers and above the lower limits in main propulsion boilers.

If the results of the after light off sample meet the requirements for significant damage then the boiler is considered in significant damage and the ship should follow the procedures outlined in reference (a).

If conductivity and chlorides have increased since the previous sample, but phosphates remain low, then this is an indication that the boiler and/or feed water may be contaminated with shore water or seawater (reference (a) paragraphs 220-23.48-52 and 220-30.9-10). If there is an indication of shore or seawater contamination then the notes cited above do not apply.

Regardless of the type of sample taken, all out of parameter readings must be circled in red and initialed by the Chief Engineer. The remarks section on the reverse side of the log should indicate troubleshooting procedures, suspected causes and corrective actions taken. The Engineering Log should also contain enough information to recreate the entire casualty and the action taken to correct it.

Thorough knowledge and compliance with NSTM 220 will protect our equipment and

can be an invaluable aid in troubleshooting. We can prevent many boiler casualties by recognizing the symptoms of contamination early.

EOSS VALIDATION

By LCDR Del Bena

When was the last time your ETT or watchstanders validated an EOP procedure, system diagram or page checked an EOSS book? The EOSS Users Guide recommends that an internal EOSS validation be conducted annually. A good time to conduct a validation might be in preparation for the LOA or at the conclusion of the overhaul or SRA period.

Examples of common problems identified are:

- Master EOCC not updated.
- EOP books missing pages.
- EOP system diagrams not accurately reflecting current configuration/valve locations.
- Incorrect version of MCFED (the correct version is Jun 98.)
- Pen and ink changes made to EOSS without the Commanding Officers' permission/signature.

The EOSS Users Guide provides the steps necessary to submit changes/corrections to EOP and EOCC.

NSWCCD-SSES revises and distributes updated EOSS packages to ships semi-annually. They send these packages according to the following schedule:

FFG-7/AOE-6	15 Feb/15 Aug
AS/AE/CV	15 Mar/15 Sep
CG-47/DD-963/ DDG-51	15 Apr/15 Oct
LHA/LHD/LCC/AD	15 May/15 Nov
All Diesel Ships	15 Jun/15 Dec
AOE-1/LSD/LPD/ AGF	15 Jul/15 Jan

For more information on EOSS, visit the NSWCCD-SSES EOSS Website at http://eoss.navsses.navy.mil.

QUALITY ASSURANCE

By LCDR Jim Talbert

Ref: (a) CLF/CPFINST 4790.3, Vol 5
(b) COMNAVSURFLANT NORFOLK VA 242059ZNOV99

Since our last newsletter (1-99), everyone should have received the CD-ROM with Change 3 to reference (a). Reference (b) established 15JAN00 as the deadline date for installation of Change 3 and provided additional guidance for SURFLANT ships to follow. Keep in mind that the Quality Maintenance Manual, Volume 5, was completely rewritten whereas Volumes 1 through 4 were only updated. If you are missing Changes One or Two, you need to contact CNSL for guidance.

With the complete rewrite of reference (a), we have observed some confusion on the deckplates concerning the ISIC's and ship's responsibilities. This is a good time to summarize just what the requirements and responsibilities of the ISIC and ship are.

Reference (a) paragraph 1.4.1 lists the ISIC's responsibilities and, after further conversations with CNSL clarifying the intent of the paragraph, the following are the key, ISIC specific, responsibilities for surface ships:

- Organize and implement a QA Program.
- Review and sign the Memorandum of Agreement (MOA) IAW Joint Forces Maintenance Manual Vol. 2.
- Conduct QA Program assessments on assigned ships in conjunction with the IDTC for conformance to the provisions of the QA Program.
- Conduct periodic monitoring of ship's force and QA Program during maintenance periods.

The ship's responsibilities are listed in reference (a) paragraph 1.5. I have listed a few below. This is not a complete listing, nor is it a replacement for reviewing the Quality Maintenance Manual.

Commanding Officer:
- Designate the QAO in writing.
- Approve CWPs as required.
- Certify all QA personnel qualifications.
- Review and sign the MOA with respect to work accomplished on Level 1 systems.
- Approve DFSs in accordance with Part I, Chapter 8 of the QA Manual.

Executive Officer:
- Monitor the QAO's administration of the QA surveillance, training and qualification programs.
- Provide senior command level authority to backup the QAO in the performance of the QAO's duties.
- Spot check performance of QA training.
- Assign an AQAO if needed.

Department Heads:
- Review or approve CWPs as required.
- Ensure departmental personnel who are involved in the maintenance of Level 1 systems receive and participate in continuing QA training.
- Review DFSs for technical accuracy and sign.
- Spot check QA training by attending or monitoring training at least quarterly.

Supply Officer:
- Manage the procurement, receipt and stowage of Level 1 materials.
- Designate and maintain areas of storage for Level 1 materials.
- Participate in the oral examination of Controlled Material Petty Officers (CMPOs).
- Ensure Supply Department personnel are trained on the receipt and storage requirements for Level 1 materials.

Division Officer:
- Review CWPs as required.
- Verify controlled work in accomplished with an approved CWP.
- Supervise QA training of divisional personnel.
- Provide timely responses to QA Form 14s.

Quality Assurance Officer:
- Administer the ship's QA Program.
- Determine the suitability for use of Level 1 material transferred directly from a donating ship.
- Authorize the downgrading of Level 1 materials.
- Review all DFSs for accuracy and technical merit.

Work Center Supervisors and Craftsmen, as well as other personnel, have specific QA responsibilities that are listed in reference (a). The above review is a not a complete list of QA responsibilities for each person on board your ship. Subsequently, it is imperative that all of us read this manual and know the requirements.

Quality Assurance is not the job of a select few individuals on board, but an all hands effort to ensure repairs are accomplished correctly the first time.

TRAINING

QA QUALIFICATION REQUIREMENTS

By LCDR Jim Talbert

Ref: (a) CLF/CPFINST 4790.3, Vol 5

With the promulgation of Change Three to reference (a) there has been an important change to the qualification requirements for all maintenance personnel. The new requirement now mandates that all maintenance personnel must be both NAVEDTRA 43241F-301 3M Maintenanceman and NAVEDTRA 43523A-301 QA Craftsman PQS qualified prior to performing any maintenance.

This is a reminder for everyone to crosscheck your PQS charts and goal sheets to ensure your personnel are qualified to conduct maintenance.

MATERIAL/ TECHNICAL

Editor's Note: After a several year hiatus we are again going to write about material/technical issues that affect the fleet. These will include recaps of important messages to you as well as issues observed on the deckplates that will benefit engineers. If you have an idea or topic for discussion let us know!

GENERAL

FUEL OIL LEAKS

By LCDR Jim Talbert

Ref: (a) NSTM 541
(b) Gas Turbine Bulletin NR 17
(c) NSTM 233
(d) NSTM 221

References (a) through (d) clearly state that fuel oil leaks are unacceptable in engineering plants. Ships need to rigidly enforce the "no fuel oil leak" policy. Watchstanders should be trained to recognize and take action on all observed/reported fuel oil leaks.

Reference (a), paragraph 541-2.2.1 defines a fuel leak as any unintended release of fuel, whether from pipes that leak, valves that leak by, valves that are accidentally left open, containers that spill, or any other source. The following paragraphs address the common leakage problems associated the fuel piping systems on the three propulsion platforms (gas turbine, diesel, steam).

All ships have fuel oil storage and service systems constructed of carbon steel, copper-nickel, or stainless steel piping. Reference (a) has identified carbon steel as the most common type of fuel piping onboard ships. Historically, carbon steel fuel piping in bilges is becoming severely corroded and has been a major contributor for fuel leaks. All personnel must pay particular attention to fuel piping to identify leaks. Reference (a), paragraph 541-2.4.3 provides the following guidelines to prevent leaks:

- Inspect **all** carbon steel fuel piping IAW NSTM 505, Piping Systems.
- Inspect copper-nickel or stainless steel fuel piping for physical damage.
- Keep fuel system piping properly painted IAW NSTM 631, Volume 2.
- Check fuel oil valve glands and packing for leakage.
- Immediately shut off the fuel supply to any fuel leak and repair all leaks.
- If soft patches are used on fuel piping, repair as soon as possible and a DFS should be submitted.
- Always use new gaskets when assembling fuel system joints.

As a reminder, ultrasonic testing (UT) alone has proven ineffective for verifying the integrity of carbon steel fuel piping. NSTM 505 requires a visual inspection to identify the thin areas, then uses the UT to further evaluate these areas. The importance of properly maintaining your fuel piping can not be over emphasized.

Reference (b) provides terms and definitions of the four types of fuel oil leaks you are likely to discover on gas turbine engines. They are as follows:

- Running leakage - a loss of fluid in excess of 10 drops in 5 minutes.
- Leakage - a loss of fluid from 6 to 10 drops in 5 minutes.
- Seepage - a loss of fluid of 1 to 5 drops in 5 minutes.
- Weepage - a visible sheen on the fitting, flange or hose that does not meet the criteria for seepage, leakage or running leakage.

Once you have discovered and classified the type of fuel oil leak you have, reference (b) also dictates your required course of action. To summarize, if you have either "running leakage" or "leakage" you are to secure the engine immediately. If you have "seepage" you are to post a fire watch until the engine is shut down, which should be at the earliest opportunity. And if you have "weepage" from fittings, hoses or flanges, wipe it down at the next shutdown and

document the leakage in the Equipment Deficiency Log/CSMP for subsequent repair.

On diesel engines some minor fuel leakage is acceptable depending on the type of fuel oil system you have. An article titled "Revisions to NSTM 233" in ATG Newsletter 1-99 identified these two types as 'fuel oil lubricated' or 'closed fuel' systems. The Colt-Pielstick and ALCOA diesel engines are the only engines used by the Navy that have external components that are fuel lubricated. All other diesel engines are not permitted to leak or weep fuel oil. All personnel who operate, repair or stand watch on diesel engines need to know which type of engine they have and learn the requirements of reference (c).

On steam ships, reference (d) and PMS provide the fuel leakage rates for burner fronts and was also discussed in the 1-99 Newsletter. Some minor internal leakage is allowable, but **zero external leakage is the standard** while the boiler is in operation. Another problem area is was the leakage of the Safety Shutoff Devices (SSDs) on the burner front where the burner barrel mates up to the SSD. This often becomes apparent during increased burner front/manifold fuel oil pressure experienced during high power demonstrations. It is a safety hazard you should not accept. SSDs have gaskets and seals that must be maintained in proper condition or failure at the higher fuel pressures will result. It may prove beneficial for ships to conduct high power operations to observe their burner fronts for leakage prior to actually needing the high speeds.

In closing, the main point to remember is that fuel leaks are dangerous and must not be tolerated. All personnel need to prevent leaks instead of reacting to them. Perform your fuel system and equipment inspections carefully and thoroughly. Many of these problem areas can be readily identified during the performance of MLOCs. The safety of the ship and your fellow shipmates depends upon the effectiveness of these inspections!

FLEXIBLE HOSES

By LCDR Del Bena

Ref: (a) NAVSEA S6430-AE-TED-010, Piping Devices, Flexible Hose Assemblies (dtd 15 July 1996)
(b) ACN 3/A , Flexible Rubber Hoses; Change to Periodic Maintenance (dtd 10 Dec 97)
(c) PMS MIP 5000 MRC A-1 and A-2
(d) General Gas Turbine Bulletin 6 (GGTB- 6)

An increasing number of rubber and wire braided flex hoses have been observed with missing identification tags, out of tolerance alignment with piping systems, broken braids, bulges and unusual discoloration. The majority of supervisory personnel seem unsure of the required inspection/installation criteria for flexible hoses. This lack of knowledge significantly impacts the effectiveness of the ship's maintenance practices, QA Program and ability to conduct an effective material self-assessment.

References (a) and (b) provide the basic guidance on piping and flex hose assemblies installed on ships, hydrostatic test requirements, and tag replacement criteria. It also provides basic information needed by personnel to understand the applications and life cycles of flex hose assemblies.

Reference (b) paragraph 2 modifies the criticality and extends periodic replacement requirements of reference (a). The critical hose assembly replacement limit has been extended from 7 to a maximum of 12 years, providing no other replacement criteria is met. Non-critical hose assemblies have no periodic replacement limit and are allowed to remain in service until they fail an annual inspection or fail in service.

Reference (b) paragraphs 11.4 and 3.12 also define the criticality and expected service life cycle of an installed flexible hose assembly. It is important to understand that criticality applies only to rubber hoses. Metal, polytetraflouroethylene (PTFE) and thermo-plastic hoses are not affected by the same factors that can prematurely age rubber and thus have **no** limiting service life.

Reference (a) paragraph 11.4 discusses the criticality determination for rubber hose assemblies. Rubber hoses used in equipment/ systems that exhibit any one of the following six parameters shall be designated as critical. Those parameters are:

- Mission Essential
- Ship Safety
- Hazardous Fluid
- Hazardous Pressure
- Potential for Collateral Damage
- Repair Capability Not Onboard

There are two separate elements that define the life cycle of a flex hose assembly. They are Shelf Life and Service Life. Shelf Life is the period of time dating from the time of manufacture (cure date) and generally ends upon installation. Reference (a) para 11.1.2 states that the basic shelf life for a rubber hose, either in bulk form or hose assembly, is six years. The hose cure date is expressed by the quarter and year of manufacture on the identification tag. Service Life is defined as a period of time in which a rubber hose is installed and in use. Service life is considered continuous once started and includes intermittent down time.

Reference (b) paragraph 1.2.1.1 reiterates that in accordance with OPNAV Instruction 4790.4, where differences exist between technical directives and PMS, PMS (reference (c)) takes precedence. Maintenance of general purpose hose assemblies is usually covered by PMS. All flexible hose assemblies must be inspected at least annually.

Reference (a) paragraph 10.1 provides periodic inspection criteria for rubber hoses. Common problems discovered are:

- Missing identification labels
- Twisted, kinked, or unusual appearance of the hose.
- Hoses painted greater than 10% of their surface area.
- Loose or misaligned pipe supports

Reference (a) paragraph 10.2 also provides the periodic inspection criteria for Metal, PTFE and thermoplastic hoses. Common problems are:

- Missing identification labels
- Twenty or more external wires on metal or PTFE hoses are broken in random locations.
- Any cut, slice or gouge involving 4 or more adjacent wires on metal or PTFE hoses.

Requirements for inspection of flexible hoses associated with GTM's and GTG's are governed by reference (d) which supercedes the requirements in reference (a).

Reference (a) paragraph 8.5 further states that after fabrication and satisfactory test of a hose assembly, an identification tag similar to figure 8-1 (of reference (a)) shall be made and attached to the hose assembly. Tags manufactured locally shall contain, as a minimum, the following information:

- Ship I.D.
- Hose Type/Size
- System Pressure
- Installation Date

The tag shall be attached with either nylon or metal self-cinching straps.

The scope of reference (a) covers only permanently installed flex hose assemblies. PMS normally covers maintenance of stowed hoses such as seachest blow hoses, fire hoses and other portable hoses, such as pneumatic tool hoses. The reason for this is that portable hoses receive more wear and tear from handling. PMS for these portable hoses usually involves more frequent inspections and periodic hydrostatic testing.

Supervisors should ensure familiarity and compliance with these references. Understanding this information will ultimately reduce the number of hoses requiring replacement, improve equipment reliability and save valuable maintenance money.

VALVE MAINTENANCE

By LCDR Richard A. Radice

Ref: (a) NSTM 505
(b) NSTM 078
(c) CLF/CPFINST 4790.3, Vol. 5
(d) OPNAVINST 5100.19C
(e) 5000 series MIPs

Is the pressure on an eductor suction gage equal to your firemain pressure? Is there a green crystal like substance on your firemain and seawater valves? Are the valves in your fuel/lube oil systems hard to open/close? These are prime indicators to the effectiveness of your Valve Maintenance Program.

Valve Maintenance can be time consuming, dirty work. While it is not as challenging or rewarding as troubleshooting and repairing diesels, gas turbines, electronic control systems or pumps, but it is critical to the overall safety and material readiness of our ships. It continues to be a tough program. Too often, small problems are ignored until they become big ones. (You can pay me now or pay me later.) This is a management problem!

So, if the pressure reading on an eductor suction gage is equal to your firemain pressure, it is an excellent indication that the firemain actuation valve seat is leaking-by and could result in a major flooding casualty if the eductor suction valve is leaking by or left open.

The effectiveness of a command's Valve Maintenance Program can and should be assessed daily by Engineering Supervisors on the deckplates. Take a look around your spaces and examine the material condition of the valves. What do you see on the deckplates?

Two key elements of a successful program include periodic inspection and planned maintenance. It should be part of your daily routine. PMS spot-checks, zone inspections and observed evolutions offer an excellent opportunity to verify the material condition and operation of systems and valves. Discrepancies need to be identified, documented and immediately corrected. Don't wait for a casualty to find that a valve is frozen or missing a handwheel.

Valve maintenance is also a safety issue. Improper maintenance can cause fire and flooding or inhibit the repair party's ability to combat these casualties. During maintenance, valve leak-by makes double-valve isolation difficult, and occasionally impossible. Proper valve maintenance minimizes these risks. A consistent, daily effort will pay huge dividends in the long run.

A general valve inspection checklist is provided as an addendum to this newsletter. Derived from PMS, it is an excellent tool for training supervisors and junior personnel in valve maintenance and can be used as a supplement to PMS or as the starting point for valves that may not be covered by PMS.

BARSTOCK VALVES

By LTJG B. Minard

Ref: (a) NSTM Chapter 505 Art 9.2.9
(b) NAVSEA Advisory Letter Ser 56Y23/342 dtd 17May89

During recent assessments we have discovered an increasing number of barstock valves improperly installed in fuel oil and lube oil systems. These valves are commonly known by their commercial names, for example, "Hoke" valves.

In accordance with references (a) and (b), these valves must consist of a separate body, bonnet, stem, packing nut, stem seal and handwheel or handle. They must also provide positive blow-off protection. The positive stem blow-off feature is required to preclude inadvertently removing the stem through the bonnet when opening the valve and to prevent system pressure from ejecting the stem.

Since the issuance of reference (b), Revision B has been made to the MIL-V-24578 barstock valve. This revision is a Non-swaged Union Bonnet valve. Valves of the union bonnet type are provided with a panel mounting nut. If these valves are to be placed in a non-panel board installation, the panel nut is to be removed to prevent it from locking up against the bonnet and union nut creating one unit and allowing the stem to back out.

For additional or specific guidance on the installation and or replacement of barstock valves refer to references (a) and (b) (reference (b) is attached as Addendum B to this Newsletter). Reference (b) also contains valve National Stock Numbers and a guidance chart used to determine if a valve requires replacement or an installed keeper.

Editor's Note: A picture can be worth a thousand words. Reference (b) was promulgated several years ago and it may be hard for you to find, so we have attached a copy of the original NAVSEA letter as reference and training material. Hope it helps.

GROUND DETECTION CIRCUITS

By LCDR Rick Lawrence

Ref: (a) NSTM 300 (Rev 4)

These circuits are the three-phase AC Ground Detection panels found on many power distribution panels. They consist of three lamps and a button that is pressed to test for grounds. The lamps actually indicate imbalances between phases to ground and are sometimes dim due to the different capacitances to ground on particular phases. In these cases, dimmer lights do not necessarily indicate a ground, and some indication of imbalance is natural. Section 3.2.6 of reference (a) discusses ground detectors in detail.

Occasionally, RFI (Radio-Frequency Interference) filters are installed across two phases of the circuit downstream of the detection circuit to protect sensitive electronics. These filters can cause one indicator on the detection circuits to dim significantly or even appear extinguished. This presents difficulty when checking for grounds, as false indications of ground may occur. This condition should not be accepted because the indicator circuit does not function properly to alert operators to grounds. Paragraph 3.2.6.2.4 of reference (a) provides guidance in these cases. A 0.5 microfarad (μF) capacitor of the appropriate voltage rating should be installed in each phase of the ground detector circuitry to more evenly balance the phases. With this modification the phases should appear more balanced and the indicators will not give a (false) ground indication. This modification does not change the system's ability to detect grounds if they occur.

The fact that RFI filters are installed downstream of the power distribution panel is frequently posted on the panel cover or ground detector panel. This is good engineering practice and is very useful when searching for grounds, but doesn't solve the primary problem of the indicator that doesn't function properly. Watchstanders who operate the electric plant and the electricians who perform PMS should be knowledgeable of the characteristics of the ground detectors throughout the ship. Specifically, they need to know what constitutes a normal indication for each detector.

Another recommended action that the Electrical Officer can take is to document all locations where RFI filters are installed and their corresponding power supply breakers organized by load center. This information can then be integrated into the ship's ground isolation procedure to facilitate rapid ground isolation.

ELECTROSTATIC PRECIPITATORS AND DEHUMIDIFIER OPERATION

By LCDR T. R. Weber

Ref:
(a) NAVSEA S9086-HK-STM-010/CH-241
(b) MIP 6650/002-47
(c) MIP 2411/024-39
(d) ECP NO. MA-342 (MACHALT 241-44002)
(e) EOP RGVS

Over the past several months there has been an increase in the number of main reduction gear Electrostatic Precipitators (ESP) and Dehumidifiers that were either malfunctioning or out-of-commission. There were varying reasons/causes behind each of the degraded/OOC ESPs and dehumidifiers, but the results are the same: unnecessary hazards to personnel and equipment.

ESPs remove airborne oil fog emanating from the Main Reduction Gear (MRG) vent air stream before it can is discharged into the machinery space. Normal operation of the ESP is indicated by the steady glow of the pilot light with no visible emission of oil mist/water from the precipitator. Some common symptoms of a malfunctioning ESP are:

- An intermittent, flickering or extinguished light is an indicator of improper power pack or precipitator operation;
- Emissions of smoke or oil indicate either precipitator or equipment malfunction;
- An emission of water vapor indicates the presence of water in the oil.

The bottom line for ships with a malfunctioning or OOC ESP is that any abnormal operating conditions should be addressed and corrected as soon as possible. In the specific case of a visible oil mist, reference (b), MRC S-2R, must be performed at the first opportunity. The Main Reduction Gear can continue to be operated in the event that the ESP is OOC. However, all efforts should be made to return the ESP to operation as quickly as possible.

CAUTION: Aside from changing the pilot light bulb, ESP PMS or repair creates an opening into the MRG. All three MRCs from reference (b) state that "permission to enter the reduction gear must be obtained from the Engineer Officer; and, this authority cannot be delegated."

As an additional note, reference (d) is the approved MACHALT to upgrade ESPs for MRGs from 10 scfm to 50 scfm for the DD-963 class and CG-47 thru CG-59. The 10 scfm ESPs are not of sufficient capacity to remove all the oil from air exiting MRG vents. NSCWCCD-SSES records indicate that the MACHALT installation completion rate is 93%, so there is a chance that your ship has not yet received the upgrade. If you have not received the upgrade yet, submit a work request to have it accomplished during your next availability.

Dehumidifiers remove moisture from the air inside the MRG to prevent internal rusting. Reference (a), Figure 241-3-2, provides a flow diagram specifying when the dehumidifier is required to be in operation. The bottom line for ships with OOC dehumidifiers is that if the main lube oil system is available and operated continuously or if the lube oil system is available and operated once per week in conjunction with jacking the MRG, then the ship has 4 weeks to repair the dehumidifier. After 4 weeks with an OOC dehumidifier, the ship is required to install a temporary dehumidifier, inspect, circulate oil and jack the MRG once a month.

CAUTION: References (a) and (e) state that when the lube oil system is in operation, never align the casing ventilation system for dehumidifier operation. Refer to references (a) and (e) for proper dehumidifier operation.

SIGHT FLOW INDICATORS

By LCDR Steve Murray

Ref: (a) NSTM 241

A sight flow indicator (SFI) is used in journal and thrust bearings to provide a visual indication of oil flow. Most SFIs have a provision for installing a thermometer for local temperature reading and, in some designs, provisions for installing RTD's for remote temperature monitoring.

An increasing number of recurring deficiencies have been noted with SFIs. Specifically, MRGs and Main Engines have been operated with SFIs that exhibit either no observable oil flow, restricted oil flow or are flooded.

Per reference (a), you are not to operate the MRG when any sight flow indicators show a complete loss of oil flow. Loss of oil flow can be caused by foreign material clogging the pickup tube or spray nozzles inside the SFI, or it could be the more catastrophic loss of flow to that bearing. Investigation of a no-flow condition should take place immediately and the equipment should be stopped per the applicable EOCC.

SFIs with restricted oil flow (e.g. flow on only one side of a two-sided SFI) and flooded SFIs should be noted and investigated at the earliest opportunity. If operating experience shows that a bearing SFI normally runs partially full or flooded, but there is evidence of flow as

indicated by oil turbulence in the SFI, then this condition is considered satisfactory and no immediate corrective action is required. However, if the flooding in an SFI obscures any indication of oil flow, this should be treated as a no-flow condition (loss of lube oil) and action taken accordingly.

DIESEL

DIESEL ENGINES AND LUBE OIL SYSTEM FLUSHING REQUIREMENTS

By LT David Allison

Ref: (a) NSTM 233 (Rev 2)
(b) NSTM 593

Questions have been raised concerning what repair procedures on diesel engines and associated lube oil systems require a post repair lube oil flush. References (a) and (b) require that diesel engines and associated lube oil systems be intensively cleaned by flushing after:

- Complete overhaul.
- Main or connecting rod bearing failures.
- Casualties where particles from failed components have been circulated in the lube oil system and found in the lube oil filters/strainers or there is visible contamination in the lube oil.
- Complete or partial engine overhaul. Rebuilt engines from OEM's, commercial engine repair facilities and naval repair facilities shall be flushed by the overhauling activity prior to delivery.
- Installing a new or stored engine where the internal lube oil system has been preserved with MIL-C-16173.
- Fresh (jacket water) or salt-water contamination of lube oil system.

The following engines require **hot** oil flushing if the above circumstances occur:

- All models of Fairbanks-Morse.
- All models of EMD and GM.
- All Colt-Pielstick.
- Caterpillar 3500 and 3600 series.
- Ruston-Paxman.
- Detroit Diesel Allison (C) Stewart Stevenson model 149.
- All models of Alco.

An exemption for repaired / new engines from reference (a) states in part:

> "New engines preserved with MIL-L-21260 shall not be lube oil flushed, however, the external lube oil systems shall be flushed. Engines that are being repaired that require removal of internal components do not require flushing provided that precautions are taken to prevent internal lube oil wetted surfaces from becoming contaminated. A certified Diesel Inspector will make final determination of flushing requirements prior to completion of the repair."

Additionally, if an engine has an external lube oil system installed, and meets any criteria requiring flushing, it must be hot oil flushed.

GAS TURBINE

DD 963 AND CG 47 SIGNAL CONDITIONING ENCLOSURE (S/CE)

By LCDR Jared Keys

Ref. (a) NAVSEA S9234-BV-MMP-010

The Signal Conditioning Enclosures (S/CEs) are located in each Engine Room and in CCS. They monitor and condition inputs from propulsion, electrical and auxiliary equipment, then pass the conditioned signal to meters, the data bus and alarm detectors. Each S/CE has a built in test routine that runs in hierarchical order. When one of these tests fails, the S/CE will generate an "S/CE Fault" on the CISE in CCS. Once the alarm has indicated, it will remain on until the condition is cleared. The only way to determine if an additional problem has occurred is to go through each S/CE cabinet to search for individually faulted cards.

S/CEs are often found in a faulted state. An S/CE fault that cannot be cleared constitutes an operational deficiency. This philosophy should be an integral part of the ship's engineering department operational procedures to note and correct immediately (this condition is akin to a safety device not working properly). It is well within the ship's capability to troubleshoot and isolate/correct a faulted input device or card, thereby restoring full functionality to the S/CE and ability to determine if other devices have faulted.

Unfortunately, ship's force personnel routinely ignore S/CE faults. When asked, they do not know what the CISE or SC/E alarm/fault means and or how to determine the cause. If repairs cannot be made, the function (depending on the equipment affected and inherent redundancy) may be an operational restrictive deficiency.

The bottom line is: Don't ignore CISE and/or SC/E faults, fix them!

D-1 DRAINS

By LCDR Del Bena

Ref: (a) NAVSEA S9234-AD-MMO-010 (LM 2500 Techman)

The D-1 drains are designed to allow watchstanders to observe whether or not the gas turbine engine has any internal components that are leaking and repair action needs to be taken.

Per reference (a), there is **no acceptable leakage rate** (i.e. no indication of fuel) in the D-1 drains for an LM 2500 gas turbine engine that is secured. There is allowable leakage rate criteria for a running LM2500.

The allowable leakage rate for a running LM2500 is based upon the component that is determined to be leaking by. Those leakage rates are:

Fuel Manifold Shroud	None allowed
Vane Actuator	2 CC each
Main Fuel Control	1 CC
NR1/NR2 Fuel Valves	15 CC each
Fuel Pump Drive	3 CC
Fuel Purge Valve	.008 CC

(Leakage per min (25 DPM = 1 CC))

The total allowable drainage is 21 CC per minute (950 DPM).

If leakage is discovered, ship's force can pinpoint the source(s) of allowable leakage by:

(1) Separating the individual lines feeding the D-1 drain.

(2) Operating the GTM

(3) Checking to see if the component is leaking.

An LM2500 showing indications of fuel in the D-1 drains while it is secured or in excess of the allowable limits of reference (a) should be investigated immediately and will be considered to be in an RBO (Repair Before Operate) status during an assessment.

OPERATIONS

ENGINEERING EVOLUTIONS

By LCDR Del Bena

Ref: (a) COMNAVSURFLANTINST/ COMNAVSURFPACINST 3540.12

A common question asked by watchstanders during assessments is: "How do the ATGLANT N43 Assessors determine grades for engineering evolutions?"

To begin with, all assessments are conducted in accordance with reference (a) and include evolutions. Engineering evolutions are specifically conducted during Initial Assessments to determine watchstander level of knowledge/proficiency. A grade of satisfactory or unsatisfactory is assigned based upon the criteria discussed below. For Underway Demonstrations a minimum satisfactory completion rate of 65% per watchteam is required to recommend the qualification of the watchteam.

The EOOW should coordinate with the space ETT member to ensure that each evolution has an ATGLANT N43 Assessor and ETT member present at the start of the evolution. The Assessor will then observe the watchstander and determine a grade based upon the watchstander's use of the correct procedure (PMS, EOSS, NSTM), use of required PPE, and successful completion of all steps in the procedure. If there are any problems conducting the evolution (materially or procedurally) it is expected that the watchstander will report this problem to the EOOW as part of the evolution. The Assessor will grade the evolution unsatisfactory if the watchstander does not use or follow the governing procedure correctly, does not use or is missing PPE, conducts a safety violation, or fails to report any problem conducting the evolution to the EOOW.

This means that first and foremost, the procedure must be available and actively referred to by the watchstander. There is NO leeway for an incorrectly conducted evolution--either it was conducted correctly and is evaluated as "satisfactory" or it is graded "unsatisfactory". Any material discrepancies noted during the evolution will be documented in the material section of the Assessment Report.

DAMAGE CONTROL/ FIREFIGHTING

FIREFIGHTING

MAIN SPACE FIREFIGHTING TRAINING

By CAPT Jim Miller

Editor's Note: This article first appeared in the Spring 98 PEB Newsletter. It is being republished in this edition because the comments remain relevant to Main Space Firefighting capability/training. Reviewing this article with your DCTT and fireparties will help improve your ability to combat a main space fire and assist in training the crew.

Too many ships have demonstrated problems with their ability to extinguish a Main/Auxiliary Space Class "Bravo" fire. These problems are driven by a number of factors, including failure to train personnel on the requirements of NSTM 555 and the ship's Main Space Fire Doctrine, poor demonstration of fundamental firefighting and damage control skills, and poor command and control. Ships that train to their doctrine and emphasize fundamentals maximize training value. Using the following framework as a basis for firefighting training may help improve their performance.

Break the drill into five parts: (1) Initial Watchstander Actions, (2) Evacuation, (3) Space Reentry, (4) Firefighting, and (5) Post Fire Actions. Each of these parts can be further reduced to specific steps in order to focus training on fundamentals.

(1) Initial Actions (Space Watchstanders)

- Reporting of the leak.
- Effective deflection of the flammable liquids away from heat sources and electrical components.
- Isolation of the leak.
- Use of installed firefighting systems to flush the flammable liquids into the bilge.
- Once the fire has been initiated, utilization of installed AFFF and portable AFFF/PKP to aggressively fight it, attempting to prevent it from going out of control.
- Making reports as appropriate.

(2) Evacuation

- Once, for drill purposes, the fire is put out of control, making reports to that effect.
- Utilizing installed firefighting equipment and portable PKP to cover watchstanders while moving to the nearest exit.
- Effective utilization of SEEDs while backing out of the space.
- Donning of EEBDs, when/where appropriate, to assist in escaping from the space.
- Activating Halon and installed Bilge Sprinkling Systems.

- Verifying activation of both systems.
- Ensuring cutout valves for the in-space AFFF hosereels are shut.
- Making required reports to the On-Scene Leader, Locker Officer and EOOW/DCA.

(3) Space Reentry (which includes all supporting command and control efforts)

- Rapid setting of General Quarters (or DC Quarters, as appropriate) and material condition "Zebra".
- Establishing communications between DC Central, Repair Lockers and the Scene.
- Effective employment and coordination of Investigators.
- Dressing out the fire party, including such things as warming up the NFTI.
- Effective turnover between the EOOW and the DCA.
- Setting of fire boundries.
- Setting of smoke boundries (including setting negative or positive ventilation as required by the ship's doctrine).
- Mechanical isolation (including validation of isolation lists and training of space isolators as to exactly how to go about executing their responsibilities).
- Determining Halon effectiveness (particularly input from investigators).
- Lighting off OBAs (both methods).
- Hose handling coordination.
- Accessing the space (generally not as simple or as smooth as it sounds).
- Utilizing Overhead (if installed and appropriate) and Bilge Sprinkling Systems prior to space reentry.

(4) Firefighting

- Entering the space (testing deckplates and ladders).
- Utilizing the NFTI to help fight the fire.
- Effectively surveying the space.
- Hose handling (spacing of hose handlers, straddling hoses, etc.).
- Establishing effective communi-cations by using all available means.
- Effective firefighting techniques.
- Effectively employing either one or two hose attack as required by ship's doctrine.
- OBA/SCBA management.
- Setting a proper/effective reflash watch.

(5) Post Fire Actions (generally the weakest area we observe in firefighting)

- Rapid surveying of the seat of the fire by the Attack Team Leader.
- Determining the extent of AFFF coverage in the bilges.
- Overhauling the fire (from outside in, using a means of protecting the overhaul team by use of either installed or portable AFFF).
- Removing of flammable liquids.
- Desmoking (utilizing the most effective method in accordance with the ship's doctrine).
- Atmospheric testing.
- Plant restoration.

This list is not meant to be either all-inclusive or limiting. It represents a methodology for breaking the Main Space Fire Drill/Doctrine up into "small bites" for ease of training and evaluation. Once the fundamentals (many of which can be done in either a seminar environment or on the deckplates) are mastered, then begin to integrate them into larger and larger segments. It also helps to explain to sailors on the deckplates the "why" behind each part of the training. That way, in an emergency, if they have to improvise, they can, based upon the full knowledge of what it is they are doing.

Also remember, your Main Space Fire Doctrine has a detailed list, in fact a checklist, of the requirements that could be used just as effectively to train your firefighting team as the method provided here.

PERSONAL PROTECTIVE EQUIPMENT

By CAPT R. A. Bogdanowicz

Ask yourself, what is the most frightening event that can happen on an engineer's watch? For most people that answer would be a major fuel/lube oil leak and a main space fire. The Navy has experienced a few of these tragic events and has lost too many sailors trying to

combat the fires and escape. The one fundamental lesson we have learned from these disasters is that smoke is the leading cause of death. To solve this problem, and hopefully save the lives of sailors in the future, the Navy has developed two specific items - the Emergency Escape Breathing Device (EEBD) and the Supplementary Emergency Egress Device (SEED). EEBDs are stored throughout the ship in work and berthing areas. The SEED is worn/used by all engineering watchstanders and personnel working in main machinery spaces. It's used as a rapid means to get to the escape trunk and don an EEBD.

NSTM 077 (para 077-3.3.2) and COMNAVSEASYSCOM 030532Z MAY 93 provide guidance on the number of EEBDs onboard ships and their locations. In general, ships should be outfitted with 150% of ship's manning with EEBDs and engineering spaces should have twice the GQ manning or max number of personnel working in the space, whichever is greater.

The current shelf life for the old style Scott EEBDs is 16 years. Additional shelf life waivers will not be granted, and hopefully all units will have been converted to the OCENCO well before the old models expire.

SURFLANT is currently in the process of transitioning from SCOTT brand EEBDs to the newer OCENCO EEBD. This change-out is being done in whole ship lots. **No ship should have a mix of EEBDs onboard**. Also, there is some confusion about the new OCENCO being used as a replacement for the SEED. Even though the OCENCO can be worn on the belt, COMNAVSURFLANT 212210Z Oct 99 specifically states that the new EEBD **IS NOT** a replacement for the SEED and engineers are to continue using SEEDs per previous directives.

Each ship should also have training EEBDs onboard. For ships equipped with the new Ocenco EEBD, your allowance for training EEBDs is based upon your type of ship. For MCM/MHC your allowance is one per ship, CRUDES is three per ship, and for LHA/LHDs your allowance is 25 per ship (other ship class training allowances are still being determined).

As a reminder, CINCLANTFLTINST 3541.1G directs all units to conduct training on EEBDs. This is to include the actual donning and activation of a training EEBD within 96 hours of an individual reporting to their ship and semi-annually thereafter.

Finally, some observations on the usage of SEEDs. On numerous visits watchstanders are unnecessarily simulating the use of SEEDs during MSFDs. SIMAs in all fleet concentration areas (Norfolk, Mayport and Ingleside) can recharge SEEDs, typically within 24 hours. Also, most big decks have their own capability to charge SEEDs. Consequently, every ship should be training their watchstanders to actually use their SEEDs during drills. Ask your watchstanders when was the last time they actually used a SEED? Check to ensure they are fully charged and check them after the watchstander has egressed a space. Has the needle moved? Did the watchstanders use their SEED or breathe through their nose?

On a recent ship visit, EVERY watchstander in the space had a SEED that was below charge or EMPTY!! Are you keeping a log and are watchstanders checking each SEED during watch turnover (MIP 6641 S-1R)?

All too often, ships are using elaborate props to simulate SEEDs and watchstanders are unfamiliar with actual SEED usage. Some have not used a SEED in months or even years. The SEED is the first line of personal protection for watchstanders in the event of a main space fire. Every watchstander should know how to use a SEED and we should train watchstanders as we expect them to react in an actual fire. How are you training your engineers??

BENT OBA GUIDE ROD DANGER

By LCDR T. R. Weber

Ref: (a) MRC 6641/Q-8R/49 U96X N
(b) NAVSEA S-S600-AA-MMA-010/A-4

Allowing fire party members to train by actually lighting off their OBAs provides the best, most realistic training. However, fiscal reality will not permit the entire fire party to light off during every drill. Therefore, training teams are left with the only other viable training option: simulation.

Fire party simulation of OBA light-off procedures can be effective if the training team is actively observing the process to ensure that each fire party member actually understands and is confident with the steps he/she is taking to simulate OBA light-off.

Under no circumstances should OBA light-off simulation include taking the OBA out of the standby position (lock down position) without an uncapped canister inserted.

Raising the bail assembly handle without a canister inserted can result in the guide rods becoming bent and damage occurring to the seating surface of the plunger housing. This, in turn, creates a potential hazard to personnel if the damaged OBA remains in service. Reference (a) states that "abnormally bent guide rods must be replaced; and, do not attempt to straighten rods." Reference (b), Figure 7-2, shows the correct shape of guide rods. Any deviation from the correct shape is considered abnormal, requiring the OBA to be removed from service and tagged for repair.

Ships should consider allowing a small number of individuals to light off their OBAs during every drill opportunity and then rotate which fire party members light off during subsequent drills. Minimizing simulations should be a goal of any training team.

DAMAGE CONTROL

VENTILATION SETTINGS

By LCDR Del Bena

Ref: (a) EOP (EOCC) 'MCCFS'
(b) EOP (EOCC) 'MCCFG'
(c) NSTM 555, Figure 555-10.1

To clarify the proper use of ventilation settings during casualty scenarios, ships should review references (a) and (b) to determine which ventilation configurations are required. A review of references (a) and (b) for different ship types direct that either emergency exhaust or negative ventilation be set to control smoke.

Emergency exhaust is attained by configuring ventilation such that "ventilation supply motors should be stopped and ventilation exhaust motors operated as necessary to remove smoke from the affected space". Emergency exhaust is frequently confused with negative ventilation.

Negative ventilation, as a general rule of thumb and in the stead of good engineering practices, should be set for combatting electrical component fires (EOP EOCC MCFED). Reference (c) delineates the actions required for establishing ventilation requirements for machinery space fires (which should also be specifically covered in your Main Space Fire Doctrine).

In summary, the different ventilation settings/configurations are:

POSITIVE:	Supply on high, exhaust off
NEGATIVE:	Exhaust on high, supply on low
EMERGENCY EXHAUST	Exhaust on high, supply off

The bottom line is that ventilation should be set in accordance with outlined EOCC procedures when specified ventilation settings are directed for smoke control.

DEFLECTION MATERIAL

By LCDR Del Bena

Watchstanders routinely attempt to deflect a leak from a pressurized system with rags. This is not considered an effective way to deflect a leak. Unfortunately, it has become common because more effective deflection materials have not been pre-staged.

To assist the watchstanders, several ships have pre-staged weighted canvas or herculite blankets for use as deflection material in the

vicinity of flammable and pressurized liquid systems. These “blankets” vary in size and have been weighted by sewing chain links, sand or some other heavy, flexible material into the perimeter of the blanket. This increases the effectiveness of the blanket because it adds weight to it, easily wraps around many different piping sizes and configurations, and can be quickly tied off.

It is recommended that you request your IMA/ Sail Loft / Para Loft manufacture these “blankets” during the ship’s next availability to your specifications.

NSTM 555

By LCDR Del Bena

What revision of NSTM 555 are you currently using? What revision do you have onboard? The current revision to NSTM 555 Vol 1, is Revision 7, dated July 99.

Other pertinent NSTM chapters with damage control and firefighting information include: Chapter 079 Vol 2, Revision 1, dated August 98; and Chapter 300, Revision 4, dated March 97.

It is imperative that you ensure that you are using the latest revision to these tech manuals to update your instructions and train the crew and, just as important, that your tech library is up-to-date. The point of contact for these damage control related NSTMs is: Jerry McKernan, NAVSSES Carderock Division at: (comm) (215)-897-1222.

VALVE MAINTENANCE CHECKLIST

This general valve inspection checklist is provided as a supplement to PMS or as a starting point for valves that may not be covered by PMS:

1. Handwheel
   A. Free of cracks or breaks
   B. Proper Material. Steel is required for damage control valves where the remote operator is attached to the spokes.
   C. Secured tightly to the valve.
   D. Label with valve number secured to or imprinted to handwheel, unless label affixed elsewhere on the valve
   E. Correct color code in accordance with NSTM 505.
   F. Proper locking device installed. (If required.)
   G. Remote operator secured to valve and free to operate. (If installed.)
2. Stem
   A. Lubricated as specified for its service.
   B. Free of paint, dirt, dust, rust or other debris.
   C. Free of bends, nicks, burrs, or warps.
   D. Bushing secured and free of excess lubricant.
3. Packing Gland
   A. At least ¼ of an inch between the bottom of the retainer and the bonnet.
   B. Packing of the correct number, size and style. No leakage detectable.
   C.
   D. All gland studs and nuts in place and secured.
      1. No short / long studs.
      2. Threads clean and free of rust or other debris.
      3. Proper material.
         a. Monel / Brass (Non-Ferrous) in salt water systems.
         b. No dissimilar metals.
4. Bonnet and Body
   A. Studs and nuts in place and secured.
      1. No short / long studs.
      2. Threads clean and free of rust or other debris.
      3. Proper material.
         a. Monel / Brass (Non-Ferrous) in salt water systems.
         b. No dissimilar metals.
   B. No body-to-bonnet leaks.
   C. Preservation.
      1. Free of verdigris or any type of encrustation.
      2. Proper paint. (Where required.)
5. Disc and Seat (To be checked when valve is disassembled for other reasons.
   A. Disc properly connected to the stem.
   B. No cuts, cracks or signs of non-uniform seating.
   C. Seat secured to the body of the valve.
6. General
   A. Valve installed in the proper flow direction.
   B. Does the valve cycle freely. (Test only if operating conditions permits and after following all required safety precautions.)

Record uncorrected discrepancies in the appropriate Ship's Force Work List for expedient correction.

9505
OPR 56Y234
Ser 56Y23/342
17 May 1989

From: Commander, Naval Sea Systems Command

Subj: ADVISORY UPDATE, BARSTOCK VALVES IN FLAMMABLE AND NON-FLAMMABLE FLUID SYSTEMS FOR ALL SHIPS

Ref: (a) NAVSEA Advisory Letter Ser 56Y23/289 dated 31 Mar 89
(b) NAVSEA Advisory Letter Ser 56Y23/JIV/794 dated 12 Sep 83
(c) Naval Ships Technical Manual NSTM S9086-RK-STM-010/CH-505 (0901-LP-505-0000) dated 15 Apr 88
(d) MIL-STD-777(E) Schedule of Piping, Valves, Fittings and Associated Piping Components for Naval Surface Ships dated 7 Feb 86
(e) Military Specification MIL-V-24586 Rev A, Valve, Needle, Size 1/4-inch and 1/2-inch dated 14 Aug 85
(f) Military Specification MIL-V-24578 Rev B, Valve, Globe, Pressure Instrument, Stem Test Connection, Union End dated 3 Mar 88

Encl: (1) Drawing of an Old Style Instrument Cut-Out Valve With Swaged Non-Union Bonnet
(2) Drawing of a New Style Instrument Cut-Out Valve With Non-Swaged Union Bonnet Construction
(3) Drawing of a Valve Bonnet Retainer/Keeper
(4) Drawing of a MIL-V-24586 Vent, Drain & Sampling Valve
(5) Consolidated Technical Guidance Chart

1. This advisory superseded the reference (a) advisory. This advisory does not apply to barstock valves in reactor plant systems in nuclear powered submarines and surface ships.

2. The purpose of this advisory is to update information on use and application of barstock valves in flammable and non-flammable fluid system for all ships.

3. Reference (b) directed several corrective actions for barstock valves in the shipboard piping systems. These valves were unsuitable due to the lack of a positive stem backseat and the lack of a bonnet retaining device. The lack of a positive stem backseat resulted in cases in which the stem backed out of the valve bonnet, and the lack of a bonnet retaining device resulted in incidences in which the bonnet loosened and separated from the valve body.

4. The term “barstock valves” refers to valve types utilized in numerous applications where the compact size is an important consideration. These valves can be fabricated by processes such as forging or machining from round or barstock material. Examples of these type valves are: Instrument Cut-Out valves (MIL-V-24578), Vent,

Drain, and Sample valves (MIL-V-24586), and Instrument Root valves. To be suitable for shipboard use these valves should consist of a separate body, bonnet, stem, packing nut (packing retainer), stem seal, and the handwheel or handle. Additionally, these valves should meet the following requirements:

a. Stem backout requirements: The barstock valve stem should be designed to have a positive stop by means of metal-to-metal contact when turned in the open direction, thus preventing the stem from backing out of the bonnet. The metal-to-metal backseat may be a bonnet or packing nut. However, the bonnet should not be fabricated by the swaging process in which the bonnet is mechanically deformed (i.e. rolled) to provide a metal-to-metal backseat for the stem (see Enclosure 1). There have been incidences in which the valve bonnets were not properly swaged and the stems, having no metal-to-metal backseat, were able to back out of the bonnets.

b. Bonnet backout requirement: The barstock valve bonnet and the valve body joint should be either a union or bolted connection. The union or bolted bonnet is required to preclude backing the bonnet from the body during valve opening. For bonnets which are connected directly to the valve, there is the potential that the torque from the handle/stem can be transmitted to the bonnet, causing the bonnet to turn and separate from the valve body. This can occur due to galling between the stem threads and the mating bonnet threads. With a union connection between the valve body and bonnet (see Enclosure 2), the bonnet union nut rests on the shoulder of the bonnet but is not integral with the bonnet. Therefore, much of the valve handle torque is not transmitted to the union bonnet nut. It should be noted that the union bonnet nut, although an improved design over the direct bonnet-to-body connected valve, is still subjected to some of the handle torque. For this reason finger tightening of the union bonnet is not acceptable. The union bonnet nut must be tightened with a wrench to at least 70 inch pounds. A bolted connection, often referred to as a "keeper", is simply any locking clamp design which positively prevents the bonnet from turning or loosening as shown in Enclosure (3). The keeper installation shall not require any machining of the valve bonnet or valve body. Additionally, tack welding of the bonnet or packing gland nut to the valve body is prohibited since this could cause distortion of the valve.

5. Reference (b) recommended installing keepers on non-union bonnet valves and performing stem backout test for valves such as the Instrument Cut-Off valve (MIL-V-24578) and the Vent, Drain and Sample valve MIL-V-24586 (see Enclosure 4). At that time valves procured to MIL-V-24578 and MIL-V-24586 were supplied with the old style swaged non-union bonnet design depicted in Enclosure (1). Since the issuance of reference (b) advisory, reference (c) (paragraph 505-9.2.1(i)) and reference (d) (paragraph 4.2 page 2) have been revised to require the valves be designed with a union type body to bonnet joint connection and a positive method of preventing the stem from backing out of bonnet (excluding swaged bonnet) as depicted in Enclosure (2). Additionally, reference (e) and reference (f) have also been revised to require the valve to have the new style union bonnet and metal-to-metal stem backseat, and also added a requirement to prohibit swaged bonnet types. The new style valves are termed as non-swaged union bonnet valves. Valves meeting the requirements of reference (e) and reference (f) are currently in the national stock system. The following are several national stock numbers for the reference (e) and (f) valves.

NSN	DESCRIPTIONS
9C 4820-01-104-0611	MIL-V-24578 Valve, Globe, Inline, Union End Connection, Union Bonnet, Stainless Steel Body
9C 4820-01-246-2812	MIL-V-24578 Valve, Globe, Inline, Union End Connection, Union Bonnet, Monel Body
9C 4820-01-219-7289	MIL-V-24578 Valve, Globe, Angle, Union End Connection, Union Bonnet, Stainless Steel Body
9C 4820-01-085-3346	MIL-V-24586 Valve, Needle, Inline ¼ inch, 1200 psi, Forged Carbon Steel Body, Socket Weld End Connection, Class I, Type II, Style A

Valves ordered to the above national stock numbers and reference (e) do not need keepers or require a stem backout test. Valves not ordered to the above national stock numbers should be checked to ensure they are the non-swage union bonnet type. If they are not, the corrective action shall be per paragraph 8.

6. Currently, instrument cut-out valves installed in submarines and many surface ships have the bite type fitting and connections and the old style swaged non-union bonnets. Two commonly installed old style bite type/swaged non-union bonnet valves are Hoke valve model/drawing #10140 and #10106. The valves with the old style swaged bonnets should also be inspected in accordance with Paragraph 8 or replaced with the new style non-swaged union bonnet bite type valves. It should be noted that MIL-V-24578 does not specify the bite type fitting end connection, therefore, instrument cut-out valves with the bite type connections are considered modified versions of MIL-V-24578 valves. Currently, the following new style union bonnet bite type valves are available in the stock system.

NSN	DESCRIPTION
NSN 9C 4820-00-941-8593	MIL-V-24578 Valve Modified To Have Bite Type End Connections, Globe, Inline, Union Bonnet, Stainless Steel Body Material
NSN 9C 4820-01-291-4604	MIL-V-24578 Valve Modified To Have Bite Type End Connections, Globe, Inline, Union Bonnet, Monel Body Material

Previously, NSN 9C 4820-00-941-8593 stocked the old style swaged non-union bonnet bite type valves, however, those valves have been eliminated and replaced with the new style valves under this same NSN.

7. It should be noted there are other types of instrument cut-out valves which have the common old style swage non-union bonnet design but differ in their type of end connections (for example, bite type on one end and male thread on the other end). These valves should also be inspected in accordance with paragraph 8. It is believed that most of the old style swaged bonnet bite type valves have been purged from the stock system. However, if any old style swaged non-union bonnet valves are received from the storage system, the receiving unit should identify the national stock number that the valves were obtained from, and relay this information to the point of contact in
paragraph 10.

8. Action:

A) Existing barstock valves in stock or installed, which have the old style swaged non-union bonnets should be inspected to ensure they meet the bonnet backout and stem backout requirement. Valves with union bonnets can be distinguished between valves with non-union bonnets by the larger bonnet nut on the union bonnet valve. Valves identified as having a non-union bonnet may have the option of replacing the valve with a new style union bonnet valve or installing a bonnet retaining device (keeper) on the valve bonnet. Valves that have swaged bonnets shall have a backout test performed on them to verify their acceptance. The backout test simply requires opening the valve to the full open position, then applying a minimum of 100
inch-pound of torque on the stem in the opening position (counterclockwise) and verifying the stem does not backout. This can be accomplished in place, but normal safety precautions should be taken to prevent fluid leakage if the stem backs out and additionally, care should be taken to prevent damage to piping when applying the torque to the stem. Visually verify that no stem threads can be seen, as this will indicate that the stem had backed out too far. Valves that do not meet the stem backseating requirement can not be made acceptable by installation of a keeper and should be replaced. Replacement valves should be on hand to allow change-out when necessary. Replacement valves must have the same end connections as existing installed valves. For those valves that do not meet the bonnet and stem backout requirement, the valve replacement policy is further detailed in tabular form in Enclosure 5.

B) The typical instrument cut-off valve is provided with a standard panel mounting nut for panel mounting installations. When a new style union bonnet valve (union end or bite type end connection type) is installed in free standing position (ie. not on a gage board), this panel mounting nut should be removed. It is possible that if this nut is tightened against the bonnet union nut that the bonnet and the bonnet union

nut can become an integral unit. This situation allows the stem turning torque to be transmitted through the bonnet to the bonnet nut and thus loosening the bonnet union nut.

9. Cancellation: Reference (a) is hereby cancelled.

10. NAVSEA TPOC is SEA 56Y23, Autovon 222-0367, Commercial 202-692-0367.

TABLE 1. CONSOLIDATED TECHNICAL GUIDANCE CHART
INSTRUMENT CUT-OUT AND BARSTOCK VALVE REPLACEMENT GUIDANCE

		Required Action Deadline * (Category of Installed Valve)			
		I	II	III	
Valve Application	Fluid	Non-Back-Seating (Fails backseat test)	Back-Seating w/o Bonnet Retainer	Back-Seating w/ Bonnet Retainer	Acceptable Replacement Valve (Note 1)
Instrument Cut-out Valve	Flammable	1/A	2/A	1/C	MIL-V-24578, Valve Globe Pressure Instrument, Stem Test Connection, Union End, Stainless Steel NSN 9C 4820-01-104-0611, Inline Monel NSN 9C 4820-01-246-2812, Angle Body Stainless ST. NSN 9C 4820-01-219-7289 (Note 2)
	Non-Flammable	1/A	2/B	3/C	
Instrument Root Valve	Flammable	1/A	2/A	3/C	Replace in accordance MIL-STD-777 "Schedule of Piping, Valves, and Fittings."
	Non-Flammable	1/A	2/B	3/C	
Vent, Drain, & Sampling Valve	Flammable	1/A	2/A	1/C	MIL-V-24586, Valve Needle, Size 1/4 inch for Vent, Drain, and Sampling Service, NSN 9C 4820-01-085-3346 or NAVSEA STD-DWG 803-5184193 or 803-2177525 (Note: Valves IAW the STD DWGS are bulkier valves IAW MIL-V-24586
	Non-Flammable	1/A	2/B	3/C	

NOTES: 1. For non-ferrous flammable applications, valves shall be in accordance with NAVSEA STD-DWG 803-43843XX, non-ferrous (bronze) valves up to 400 psi service.

2. MIL-V-24578 valves with modified to have bite type tube and connection are available under NSN 9C 4820-00-941-8593 (inline body configuration, Stainless steel material) and NSN 9C 4820-01-291-4604 (inline body configuration, Monel body material)

*Explanation of Required Action/Deadlines Codes

Code Action

1. Replace valve with acceptable replacement shown in table having same end connection as existing installed valve.
2. Install bonnet retaining device (i,o., keeper). Valve now is in column III. Consult table
3. No action required

Deadlines

A. As soon as possible but not later than next availability
B. Not later than next regular overhaul.
C. When corrective maintenance requires replacement, use acceptable replacement shown in table.